NEWS

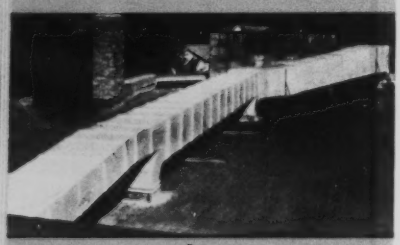
Foundation exploration by angle core drilling is rushed as other preliminary operations head toward actual construction of Gilbertsville Dam, TVA's largest.

The sales of Toncan Iron go UP

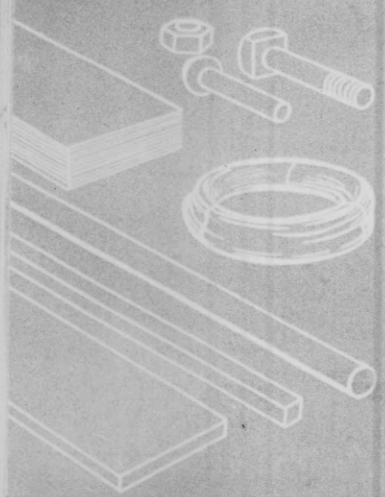
Because maintenance costs go DOWN

oncan Iron gives many extra years of life to dustrial structures.

marine service—fresh or salt water—Toncan on reduces maintenance.



or interior and exterior sheet metal work, no roduct in its price class has a better "economic scord" than Toncan Iron.



FOR THIRTY YEARS, TONCAN IRON HAS BEEN SAVING MONEY FOR INDUSTRY—

Toncan Iron was born, not "thirty years too soon," but just in time to amass proof that it can save YOU money on the new work and the maintenance work you are faced with now.

Performance records of this alloy of refined open-hearth iron, copper and molybdenum during the past thirty years prove:

1. That it possesses a higher resistance to corrosion than any other ferrous metal in its price class—
2. That this resistance to corrosion is not a surface condition but is uniform throughout the thickness of the metal—
3. That cold working—cutting, bending, forming, threading—in no way impairs its corrosion-resisting qualities.

All of which sums up to longer life and lower maintenance costs in every type of service, whether it be a sheet installation in ducts in an air conditioning system, pipe in a plumbing, heating or power system, corrugated roofing and siding on an industrial building or plates in the ballast tanks of a boat.

For thirty years, sales of Toncan Iron have been on the upward trend—because maintenance costs go down when it is used. If you want all the evidence write for these books—"Toncan Iron Pipe for Tough Service" and "The Path to Sheet Metal Permanence". If you need quick delivery, there's a distributor near you who carries a stock of this money-saving metal for your convenience. Ask us to give you his name.

REPUBLIC STEEL CORPORATION

GENERAL OFFICES: CLEVELAND, OHIO

BERGER MANUFACTURING DIVISION • NILES STEEL PRODUCTS DIVISION • UNION DRAWN STEEL DIVISION

STEEL AND TUBES, INC. • TRUSCON STEEL COMPANY

TONCAN IRON

An alloy of refined open-hearth iron, copper and molybdenum

—that grows old slowly

ENGINEERING NEWS-RECORD

NEWS

Volume 122 JUNE 1, 1939 Number 22

NOTEBOOK NEWS

Quick Surveys of Construction Events

▶ Big money for dams and national park highways is assured for next year by the Department of Interior appropriation bill signed last week. Reclamation projects will benefit in the record amount of $63,000,000.

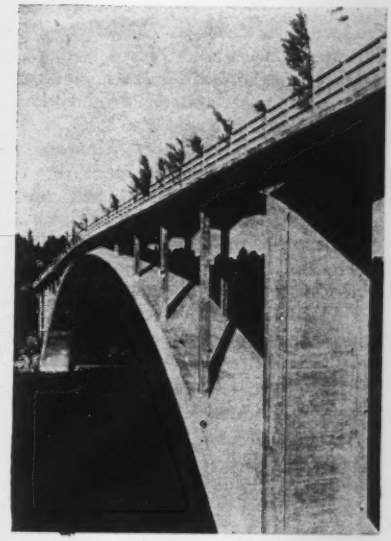
▶ Construction experience played a vital role in the rescue of the men from the submarine *Squalus* last week, for it was the late John F. O'Rourke, capable and colorful New York contractor, who in 1927 turned his inventive mood to submarine rescue equipment in the form of a diving bell and gave impetus to its later successful development. p. 7.

▶ San Francisco voters said "No" last week to a municipal distribution system for their Hetch Hetchy power despite the federal government's insistence that the P.G.&E. private system must not continue to distribute the current. p. 5.

▶ Railroads may yet get some help from Congress this session. A bill passed by the Senate puts practically all transportation agencies under the I.C.C., where, it is hoped, all will ultimately be put on a more equitable basis in the matter of regulation, rates, and compensation for employees. The railroads have piled up a big backlog of new construction waiting on better business.

▶ Spain, just recovering from a devastating war, is reported to be about to spend $290,000,000 on roads.

▶ New York engineers have launched a campaign to get better enforcement of their license law. Not having had much success in stirring up the state authorities, they have decided to hire their own legal advisers. p. 8.



NEW BRIDGE IN FINLAND

AN OUTSTANDING example of an attractive design in concrete is this recently completed twin-cell box arch across the Farjsund in Finland. It is of fixed-end design, 426 ft. long and 21 ft. wide.

Big Reclamation Bill Signed by President

The Department of the Interior appropriation bill for the coming fiscal year, which carries a record total of $63,000,000 for reclamation projects (*ENR*, May 11, 1939, p. 43) has been signed by the President.

Larger projects include:

Bonneville	$13,400,000
Colorado River (Ariz.)	1,500,000
Colorado River (Tex.)	5,000,000
Crow, Mont.	1,000,000
Colorado-Big Thompson, Colo.	1,500,000
Provo River	1,350,000
Boulder Canyon	4,000,000
All American Canal	2,000,000
Central Valley, Calif.	10,000,000
Pine River, Colo.	1,000,000
Grand Coulee Dam	23,000,000
Indian reservation roads	2,250,000
National Park Service, roads and trails	3,500,000
Blue Ridge and Natchez Trace parkways	4,500,000
Stream gaging, etc.	1,118,000

Railroad Aid Passes Senate

Bill would subject water transportation to regulation by Interstate Commerce Commission

In a move intended to aid the competitive position of the railroads, the Senate has passed and sent to the House a bill subjecting commerce on waterways in the United States to regulation by the Interstate Commerce Commission.

In the declaration of policy included in this bill, it is stated "to be the national transportation policy that Congress provide for fair and impartial regulation of all modes of transportation so administered as to recognize and preserve the inherent advantages of each . . . to the end of ensuring the development and preservation of a national transportation system."

Amends commerce act

The bill, an amendment to the Interstate Commerce Act, subjects to the regulation of the Interstate Commerce Commission "all common carriers by railroad, by water, by air, or by motor vehicle on the highways, pipe line companies, express companies, and sleeper

(*Continued on p. 9*)

• • •

Highway Reconstruction Planned in Spain

A five-year program, to cost about $290,000,000, to rebuild Spanish highways damaged by the civil war is planned by the Spanish government, according to reports to the U. S. Department of Commerce. About $80,000,000 is to be made available immediately. About 70,000 miles of road is involved in the proposed reconstruction program.

It is also reported that a total of $72,000,000 has been allotted by the government for harbor rehabilitation.

ENGINEERING NEWS-RECORD—Published every Thursday by McGraw-Hill Publishing Company, Inc. Publication Office, 99-129 North Broadway, Albany, N. Y. Editorial and Executive Offices, 330 W. 42nd Street, New York, N. Y., James H. McGraw, Jr., President; Howard Ehrlich, Executive Vice-President; James H. McGraw, Honorary Chairman; Mason Britton, Vice-Chairman; B. R. Putnam, Treasurer; D. C. McGraw, Secretary; J. E. Blackburn, Jr., Circulation Manager. Subscription rates in the United States, Canada, Mexico, Central and South American countries, $5 a year; all other countries, $9, or 36 shillings a year. Entered as second-class matter October 29, 1936, at the Post Office at Albany, N. Y., under the Act of March 3, 1879. Printed in U. S. A. Copyright 1939, by McGraw-Hill Publishing Company, Inc. Cable address: McGRAWHILL, New York. Member A.B.P. Member A.B.C.

Maryland Adopts Coordinate System

Bill authorizes surveyors to enter private land and establishes state bureau of surveys

The use of a plane coordinate system in making cadastral surveys in the state of Maryland is authorized in a bill signed May 11 by Governor O'Connor. The bill also authorizes surveyors to enter private land for the purpose of making use of survey monuments and establishes a bureau of control surveys and maps in the state department of public works to administer the act.

Recognized as official and designated as the "Maryland Coordinate System" is the system of plane rectangular coordinates adopted by the U. S. Coast and Geodetic Survey with its origin at 77 deg. west longitude and 37 deg. 50 min. north latitude. Any triangulation or traverse station established as part of this coordinate system may be used, under rules to be drawn up by the new bureau, in establishing a survey connection with the coordinate system. It is specifically provided, however, that the act does not require landowners "to rely wholly on a description based upon the Maryland coordinate system." Specifically excepted also is the city of Baltimore, which already makes use of a coordinate system established by the city bureau of plans and surveys.

"Any person duly qualified as an engineer or surveyor and his duly accredited assistants and representatives" is authorized by the bill to enter private land on which there is a survey station of the U. S. Coast and Geodetic Survey or a station which forms part of the Maryland coordinate system. Machinery for establishing the compensation to be paid for any damages done in entering the private land is provided. Injury or destruction of any survey station in the coordinate system is made a misdemeanor.

The new Bureau of Control Surveys and Maps will administer laws relating to the coordinate system, extend the system in Maryland, and also take over the duties of the present Maryland Mapping Agency. Its activities are to be directed by an *ex officio* board consisting of the chief highway engineer, the chairman of the state planning commission, and the dean of the college of engineering of the University of Maryland. The bureau is directed to carry out its work in accordance with a group of specified objectives which includes: Coordination of all mapping agencies in the state; development of permanent records of surveys and maps and uniform specifications for surveying and mapping; encouragement of the use of the coordinate system; establishment of a library of maps and charts.

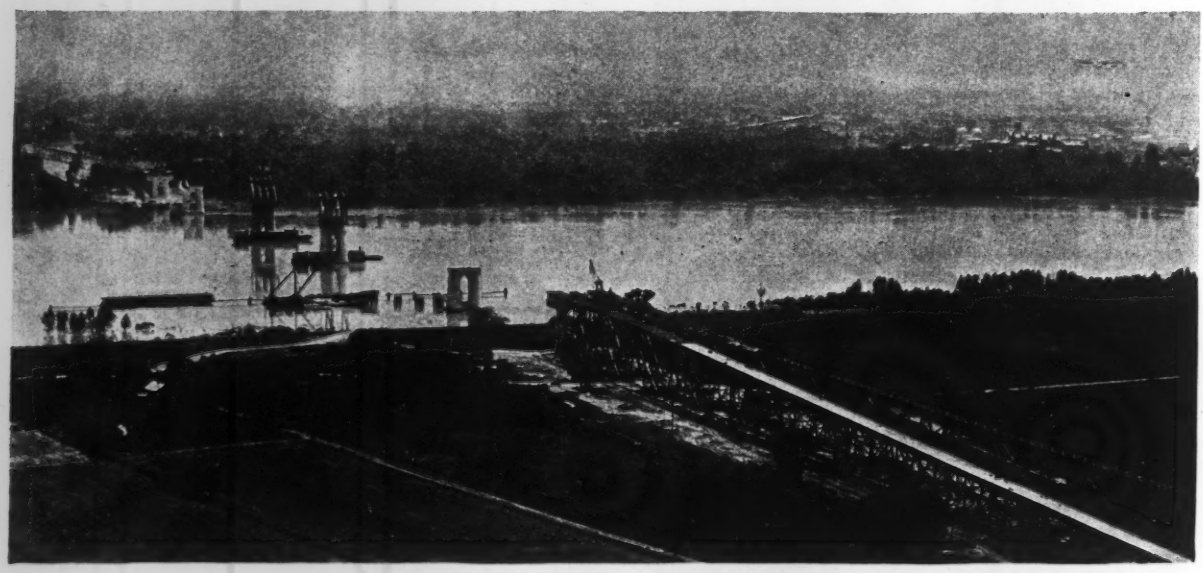
Court Hits Revision Of Sewage Plant Plans

Because village officials of Orchard Park, N. Y. changed the plans for a sewage plant project in order to bring the bid within the amount authorized in a public referendum, carrying out of contracts for the project has been enjoined by Buffalo Supreme Court.

The village officials, said the court, "seek to require the taxpayer to accept without a referendum . . . a sewerage system . . . which will cost substantially the same as the complete job specified in the proposition submitted to the voters . . . but a job less comprehensive in scope in very material respects and less valuable to the extent of $29,000." A $192,000 contract had been let for the construction of the project to Riefler Bros.

"To uphold the contracts," the court went on, "would be to say that whenever the officials of a municipality submit to taxpayers by referendum a municipal construction project and the taxpayers approve the spending of a certain specified sum and the lowest bid is far above the amount specified, the municipal officials may then proceed to delete from the plans and specifications a sufficient number of material items to bring the total cost down to the amount previously submitted to the taxpayers . . .

"I cannot subscribe to this doctrine



STEEL ERECTION BEGINS ON MAIN SPANS OF BATON ROUGE BRIDGE

Erection of steel has begun on the two main cantilever spans of the combined highway and railway bridge over the Mississippi River just above Baton Rouge, La. There are to be two channel spans of 588 ft., a central anchor span of 650 ft. and shore anchor spans of 490 ft.

Construction of the deep river piers (160 and 180 ft. below low water) began in 1937.

The bridge is being built by the Louisiana Highway Commission. Contract for the steelwork of the main spans is held by the Bethlehem Steel Co.; Kansas City Bridge Co. built the main river piers; Uvalde Construction Co. built the approach foundations and the Steel Construction Co. built the approach superstructure. H. B. Henderlite is chief engineer for the commission; N. E. Lant is bridge engineer and E. L. Erickson, construction engineer at the bridge.

. . . When the deviations are as great and material as here indicated, the taxpayers are entitled to give their judgment on the new proposal in an additional referendum."

• • •

Terzaghi and Turner On Harvard Faculty

Karl von Terzaghi has accepted a three-year appointment as lecturer on soil mechanics and engineering geology in the Harvard graduate school of engineering. Terzaghi has lectured previously at Harvard, but the present appointment gives him rank as a member of the faculty. He has taught also at Massachusetts Institute of Technology and in Europe and Turkey.

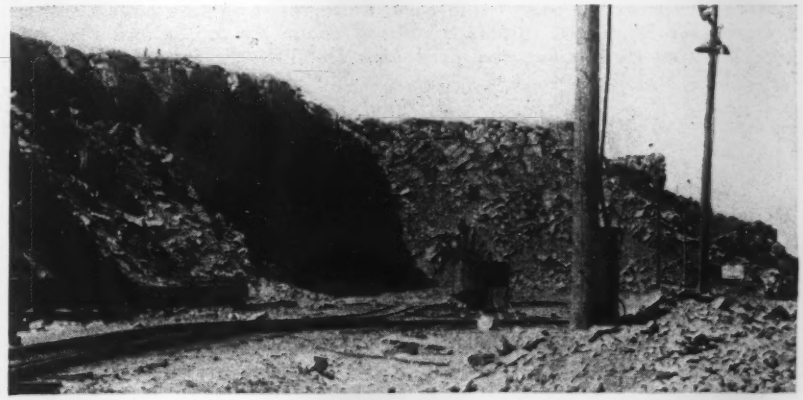
Also appointed in the Graduate School of Engineering was Howard M. Turner, Boston consultant, as lecturer on water power engineering.

New Loans Made to Cities For Low-Cost Housing

New USHA loans to nineteen cities of $27,514,000 on May 26 brought the total of loan contracts made by USHA to $434,853,000. These loans will meet 90 per cent of the cost of low-cost housing projects to be carried out by the city housing authorities.

In addition to the loans which have been made, $225,385,000 has been earmarked for specific cities, making a total of $660,038,000 in commitments by USHA.

Among the larger of the new loan contracts are: $5,733,000 to Bridgeport, Conn.; $4,258,000 to Washington, D. C.; $4,227,000 to Peoria, Ill., and $2,109,000 to Jersey City, N. J. Loans of a million or more were also received by Savannah, Ga., Omaha, Neb., Allegheny County, Pa., and Ponce, Puerto Rico.



ROCK TO TEMPER FORT PECK RESERVOIR WAVES

LONELY Snake Butte, rising out of the Montana prairies south of Harlem, gives up several thousand more tons of rock, jarred loose by a single quarry blast on May 4, for facing the upstream slope of Fort Peck Dam. Individual stones weighing as much as 800 tons were thrown out of the stratified rock formation by the blast. The riprap is loaded onto cars and hauled 137 miles. These views show the quarry bench before and after the last blast.

Shift Proposed In Boulder Power

Bureau of Reclamation would operate dam and sell power and rates would drop

Radical revision of the plan for the handling of power at the Boulder dam will be sought at this session of Congress.

It is proposed that the Bureau of Reclamation handle all operations at the dam and sell power at the bus bar. The plan would also reduce the interest rate from four to three per cent. Money expended during the construction period cost the government only slightly more than two per cent; it is proposed to use the actual cost in readjusting rates. The Secretary of the Interior would determine a reasonable allowance for operation and maintenance. Arizona and Nevada would receive $300,000 each rather than a percentage. The sum of $500,000 would be provided for the Colorado River development fund.

Congress also will have to pass on the question as to the source of funds for maintenance work on the lower Colorado river. The absence of floods has resulted in shoaling. Some damage already has been done to the levees. The question is whether the money for that work should come out of the revenues collected at Boulder Dam or should be handled as regular river and harbor projects for which specific appropriations are made.

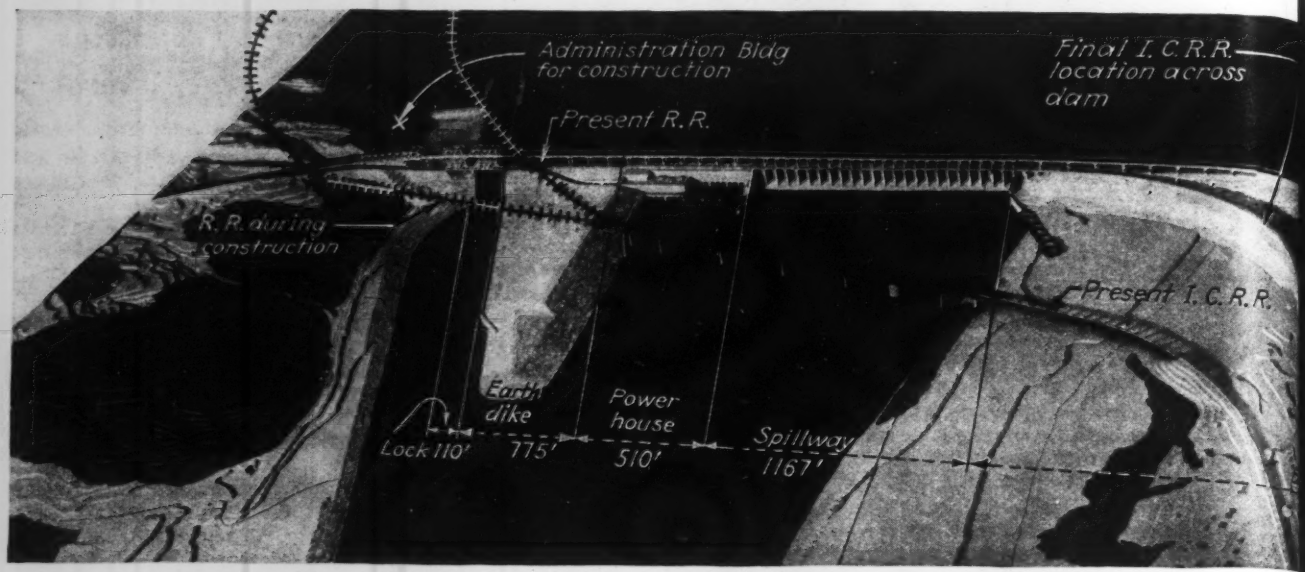
It is now apparent that Lake Mead will not reach the spillway level this year. The lake was drawn down earlier in the year.

• • •

San Francisco Voters Reject Power Plan

San Francisco voters on May 19 rejected by a vote of 50,000 to 122,000 a plan for municipal distribution of power from the city's Hetch Hetchy hydroelectric plant. The proposition would have provided for issue of $55,000,000 in revenue bonds with which a distribution system could be built or the existing one could be bought.

Rejection of the measure leaves city officials in a dilemma, since they have been enjoined in U. S. District Court from continuing to sell Hetch Hetchy power to the Pacific Gas & Electric System which now distributes it. Sale of the power was held by the court to constitute a violation of the federal Raker Act under which the city was permitted to use certain federal land in developing the Hetch Hetchy project.



SPREAD ACROSS these two pages is a picture of a model of Gilbertsville Dam, which will be TVA's largest and most expensive river structure. Features not found on other TVA dams include a railroad across the top, a lock that is not integral with the spillway but separated from it by an earth dike; and fixed high level bridges instead of lift spans across the lock. View is taken looking south.

TVA's Largest Dam Ente

AFTER TWO YEARS of foundation exploration and design studies the TVA is ready to begin construction of its largest dam to be located at Gilbertsville, Ky., on the Tennessee River twenty-three miles above its junction with the Ohio River. Camp and field office buildings are ready for occupancy, railroad relocation in the future lock area is actively under way and core boring work along the dam axis is nearing completion. Congress appropriated $12,500,000 in March for the next year's work.

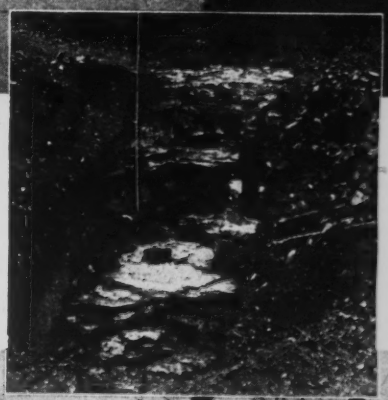
Primary purposes of Gilbertsville Dam are flood control (its reservoir has a total volume of 6,100,000 acre-ft. of which two-thirds is controlled flood storage) and completion of the 9-ft. navigation channel in the Tennessee River (the Gilbertsville pool extends 184 miles upstream to Pickwick Landing Dam). No hydro-power installation is contemplated initially.

Total cost of Gilbertsville is placed at $90,000,000, divided about equally among land purchase, dam construction and highway and railway relocation. Completion is planned by 1944. Basic data given in the article "Navigation and Flood Control at Gilbertsville" by Carl A. Bock (*ENR*, April 7, 1938, p. 497) are still applicable but both the location and design of the dam as there given have been materially changed.

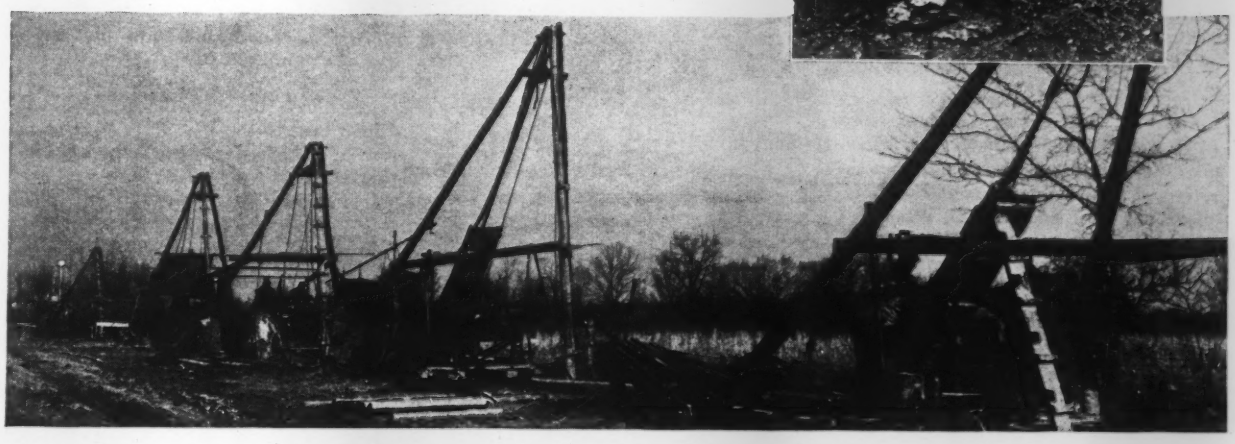
TECHNICAL DATA ON GILBERTSVILLE

Streamflow	
Av. Flow	64,000 cfs
Max. flow (1897)	450,000 cfs
Max. flood for spillway design	960,000 cfs
Storage	
Uncontrolled storage (El. 375-380)	1,420,000 acre-ft.
Total volume at El. 375	6,100,000 acre-ft.
Volume of normal pool (El. 359)	2,750,000 acre-ft.
Navigation Lock	
Lift: Maximum (El. 304-372)	68 ft.
Normal (El. 304-359)	55 ft.
Lock chamber, clear	110 by 600 ft.
Dam and Spillway	
Foundation Rock El. 250	
Normal Tailwater El. 304	
Discharge, El. 359 (Normal H.W.)	540,000 cfs
Discharge, El. 375 (Top of gates)	1,000,000 cfs
Discharge, El. 380 (Max. H.W.)	1,200,000 cfs

RAILROAD RELOCATION in the lock area on east bank. Present line turns off to right. Locomotive crane is driving piles for new trestle, beyond it foundations are being put down for a temporary lift span over the lock entrance and just over crane stack is deep railroad cut. At right on hill is the air-conditioned administration building.



onstruction Stage



THE EDITOR talks to the boss, and George P. Jessup, the project manager, calls it just another job. He was also in charge of Wheeler and Guntersville dams.

CORE DRILLING is still under way along the axis of the west embankment. Angle holes decrease the chance that pockets or faults in the rock will be overlooked. Inset, above, is a stripped area at the east abutment showing the Mississippian limestone foundation rock.

MEN AND JOBS

E. W. WHISTLER, formerly with the Colorado state highway department, has joined the Denver staff of the Western Portland Cement Association.

J. G. HUCKINS, assistant engineer for the U. S. Bureau of Public Roads, who has been stationed in northwestern Colorado, has been transferred to the Blue Ridge parkway project with headquarters at Roanoke, Va.

EDWIN J. FORT, project engineer in the New York City department of public works, is retiring June 1; he is 71. Fort entered the service of the city in 1894 as an assistant engineer in the department of highways of the City of Brooklyn, rising to the rank of chief engineer of the Bureau of Sewers when he left that department in 1919. He was for five years city manager of Niagara Falls, N. Y., and later was executive engineer of Ridgewood, N. J., and general supervisor of the City of Englewood, N. J. In 1931 he returned to New York as an engineer with the Department of Sanitation and later with the Department of Public Works. Recently, Fort has been engaged on the design of the nearly completed Tallman's Island sewage treatment plant. Fort plans to engage in consulting work on sewage disposal projects.

WILLIAM T. STAATS, assistant chief engineer of the Pennsylvania Turnpike Commission, has been appointed assistant to the chairman of the Commission. Staats has been in charge of liaison between the turnpike commission and other agencies involved on the project.

A. O. WALKER has resigned his post as division engineer for the Oklahoma state highway department.

JOSEPH W. SHIRLEY, Baltimore consultant, has resigned his post as chairman of the commission on city planning. The commission is being replaced June 1 by the new City Planning Commission, recently approved by the voters. Shirley has announced that he is not a candidate for appointment to the new commission.

CAPT. WILLIAM W. WANNAMAKER has been appointed to succeed Capt. Harry A. Montgomery as assistant division engineer in the Little Rock division of the U. S. Engineers. Captain Montgomery was recently made district engineer in the newly created district office at Tulsa, Okla.

WILLIAM F. SAUNDERS and ROBERT A. ROBINSON, civil engineers in the division of sewer construction and paving of the St. Louis board of public service, as well as GEORGE MULLINIX, draftsman, and HARRY D. MCKEEN and JAMES AUSTIN, surveyors in the division, have been dropped from the city service as an economy move. The men dismissed have been working on a WPA program which is now largely completed.

MEETINGS

NATIONAL CONFERENCE ON STATE PARKS, annual meeting Itasca State Park, Minn., June 5-7.

ASSOCIATED GENERAL CONTRACTORS, spring board meeting, St. Paul Hotel, St. Paul, Minn., June 5-7.

AMERICAN WATER WORKS ASSOCIATION, annual convention, Atlantic City Auditorium and Convention Hall, Atlantic City, N. J., June 11–15.

WATERWORKS MANUFACTURERS ASSOCIATION, annual meeting, auditorium, Atlantic City, N. J., June 13.

SOCIETY FOR THE PROMOTION OF ENGINEERING EDUCATION, civil engineering division; Iowa Institute of Hydraulic Research; and the State University of Iowa; hydraulic conference, Iowa City, June 12–15.

AMERICAN SOCIETY OF AGRICULTURAL ENGINEERS, annual meeting, St. Paul, Minn., Jan. 19–22.

SOCIETY FOR THE PROMOTION OF ENGINEERING EDUCATION, annual meeting, Pennsylvania State College, State College, Pa., June 19-23.

AMERICAN SOCIETY FOR TESTING MATERIALS, annual meeting, Chalfonte-Haddon Hall, Atlantic City, N. J., June 26-30.

NATIONAL COUNTY OFFICERS ASSOCIATION, annual convention, Ogden, Utah, July 17–19.

AMERICAN SOCIETY OF CIVIL ENGINEERS, annual convention, San Francisco, July 26-28.

REGIONAL AND LOCAL

PENNSYLVANIA SEWAGE WORKS ASSOCIATION, annual conference, Home Economics Building, State College, June 26–28.

ASSOCIATED GENERAL CONTRACTORS, North and South Carolina branches, summer convention, Myrtle Beach, S. C., July 21-22.

Short Course

WATERWORKS school, offered by the College Extension Division of North Carolina State College at Raleigh June 6–9.

• • •

License Examinations

LOUISIANA: Personal appearance before the State Board of Engineering Examiners of applicants for registration as civil engineers and surveyors, May 24; written examination, May 25-26.

MICHIGAN: State board examination for architects, engineers, and surveyors at the University of Michigan, Michigan State College, University of Detroit, and Michigan College of Mining and Technology, on June 15–17.

• • •

Big Apartment Project Planned in New York

Plans for one of the largest private apartment house projects undertaken in New York City in the past decade were initiated last week when a building syndicate, 240 Central Park South, Inc., purchased a block of land on Broadway in the Columbus Circle area of Manhattan. A 26-story apartment house containing 1,000 rooms is to be erected on the 36,000-sq.ft. plot at a cost of about $4,500,000.

Containing two, three and four room suites, the buildings will occupy about 48 per cent of the plot area. Incorporation of garage facilities is being considered.

• • •

Contractor Is Sued For Refusing Contract

The State of Connecticut has brought suit against F. H. McGraw & Co., New Jersey contractor, asking damages of $80,000 from the contractor, as well as from the Aetna Casualty & Surety Co., co-defendant.

The state charges that the McGraw company submitted the low bid last December for the substructure of a bridge across the Housatonic River between Stratford and Milford, bidding $340,000. McGraw had furnished a $30,000 bid bond, with Aetna as surety. When the highway commissioner notified the company of the award, the company refused to execute the contract and so notified the highway commissioner. The McGraw company, the states alleges, then refused to pay the bid bond.

The contract was later awarded to the A. I. Savin Construction Co. of Hartford, Conn., for $411,000, and work is now under way.

Pulp Mill Must Try To Avoid Pollution

Operation of a paper pulp mill in Florida does not in itself create a public nuisance, but operation of the mill may be enjoined if it is not using all known and practical methods to avoid polluting a river. The Supreme Court of Florida so held in a case brought by citizens of Jacksonville against the National Container Corp. charging pollution of the St. Johns River.

Pointing to a provision of the state constitution exempting new industries in the state from taxation for a 15 year period, the court held that "We have provision in the organic law which is a definite recognition that a pulp mill is not a public nuisance when properly conducted and operated."

However, the court pointed out, "the constitutional provision . . . in no wise immunizes the plant from being held to constitute a public nuisance . . . by creating an obnoxious condition which, by the application of known and practical methods, it may obviate."

The court returned the case to the lower court for determination whether the company was using all available methods to avoid river pollution.

• • •

New Jersey Ratifies Delaware Pact

The state legislature of New Jersey on May 17 passed and sent to the Governor a bill ratifying the Delaware River interstate compact under which New York, Pennsylvania, Delaware, and New Jersey agree to control pollution of the Delaware River. New Jersey is the first state to ratify the pact.

Under the compact, the Delaware basin is divided into four zones with minimum standards of sewage treatment established in each zone. The states signatory to the compact agree to pass legislation to enforce its provisions.

W. M. RICH TO PRACTICE AS MUNICIPAL CONSULTANT

WILDER M. RICH has resigned his post as city manager of Hackensack, N. J., and will practice as a consultant on municipal and administration finance with Campbell Phelps & Co., of New York City.

Rich has been in city manager positions since 1918, serving in this capacity at Sault Ste. Marie and at Ironwood, Mich.; Goldsboro, N. C.; and Alexandria, Va., before going to Hackensack five years ago. Before taking up municipal work, Rich was with the U. S. Engineer Corps on the construction of the Soo Canal.

Contractor Helped Design Rescue Diving Bell

EXPERIENCE of a contractor in driving compressed air tunnels and sinking pneumatic caissons aided in the development of the diving bell successfully used last week in the dramatic rescue of 33 men from the sunken submarine *Squalus*. After the *S-4* disaster in 1927, the late John F. O'Rourke, veteran New York contractor and engineer, turned his inventive mind to submarine rescue equipment. The result was three different types of diving bells and a special hoisting rig, on which he was granted four patents. O'Rourke's contracting experience included driving the Pennsylvania RR. tunnels under the Hudson in New York, construction of several East River subway tunnels, and pneumatic foundations for bridges and buildings, such as the railroad bridge at Poughkeepsie and the Whitehall Building in lower Manhattan.

He filed patent applications on Mar. 24, 1928, on two types of diving bells. One was a two-compartment bell, the lower chamber open to the sea. This bell was to be handled by a crane on the salvage vessel, and depended solely upon the crane for lowering and spotting to the desired location, an impractical condition. The other bell was also a two-compartment chamber, but had an accordion extension at the lower end for fastening the bell to the submarine shell at an angle; once fastened the bell remained attached to the submerged vessel, and exit was provided by a telescoping tube, fitted with a rope ladder, that extended from top of bell to above water surface. Neither of these types was ever built.

A few months later O'Rourke designed and actually built a third type bell, and a successful rescue test was made with this device on the rebuilt *S-4* off Key West Jan. 30, 1930. This bell, for which patent application was made Jan. 30, 1929, consisted of a single compartment, open at the bottom, filled with compressed air to keep out the sea water. It was lowered by a single line from the salvage boat *Falcon*, and was equipped with three winches on the outside, operated from within, that handled lines to anchors dropped some distance from the submarine. Manipulation of the anchor lines aided in spotting the bell over the hatch. A fourth patent application, made at the same time, pertained to a counterweighted derrick rigging that compensated for the roll and pitch of the salvage vessel.

Meanwhile, the Navy Department, under the direction of Commander A. R. McCann and Lieutenant Chas. B. Momsen, was working on the design of a bell, as was also the Electric Boat Co. of Groton, Conn. The latter's design was a two-compartment bell that was hauled down by the submarine crew by a line attached to a buoy released from within the stricken vessel. A test rescue from the *S-4* was successfully made with this device Feb. 5, 1929. The obvious disadvantage was the necessity for the submarine crew to haul the bell down, a difficult task in case of injuries or weakened condition of the crew. The navy's development was similar to that of O'Rourke's first bell—a double-compartment device that was hauled down by a power winch within the bell, controlled by the rescue crew. This required the services of a diver to attach the downhaul line to the sub and to assist in fastening the bell to the escape hatch. A test rescue by this device was effected Feb. 6, 1929.

Following the successful tests of all three diving bells, the Navy Department designed a modified type, incorporating the most desirable features of each, calling upon O'Rourke and the Electric Boat Co. for advice. The main features of the navy bell were retained—two compartments and downhaul by a winch within the bell. The navy gives O'Rourke much credit for the final design. The first modified bell was built at the New York Navy Yard and tested there in drydock June 22, 1931. Successful sea tests were made July 17, 1931. Five of the bells have been built and distributed to the principal submarine bases. The rescue last week at a depth of 240 ft. was the first to be made in actual disaster.

Better License Enforcement Urged

New York State Society of Professional Engineers takes steps to speed license enforcement

Failure of the New York State Department of Education to enforce the state license law as effectively as the society feels it should be done was a major theme of the annual conference of the New York State Society of Professional Engineers held at New York City, May 27. Reporting for the committee on professional ethics, D. B. Steinman said that the committee had compiled a list of 472 cases in Manhattan of men who were practicing and had never been licensed. This list was submitted to the department of education, but the department took the position that it could not proceed without additional detailed evidence on each case. It was held that use of the designation "engineer" was not sufficient evidence that the law was being violated and that the department was "not interested in enforcing a monopoly in the designation."

Steinman recommended that the society retain the service of counsel in order to expedite prosecution of violations of the license law, and it was announced a few hours later that T. A. Tuck had donated to the society a sum sufficient to permit retainer of counsel.

A new development reported by Steinman was the sale of "bootleg licenses." Engineers in various governmental departments, particularly the WPA, who had been ordered recently to obtain licenses, are approached by men claiming to be able to obtain them a license for $20. What they receive is a receipt from the State of Delaware for a $10 business tax, the receipt purporting to authorize them to practice engineering; Delaware has no license law.

Speaking at the society's luncheon, Matthew A. Hunter, dean of metallurgical engineering at Rensselaer Polytechnic Institute attacked the view, which has been advanced by some members of the society, that restriction should be imposed on admissions to engineering schools. He said that in the four major branches of engineering about 9,600 seniors would graduate this spring, of whom 3,300 would be mechanical engineers, 2,300 electrical, 2,200 chemical, and 1,800 civil.

It is impossible, Hunter said, since no figures are available on the mortality of the profession, to say whether this number is even sufficient to maintain the profession at its present number. There is little reason to fear that the number of graduates will increase at the rate it has in the past, since studies by the U. S. Office of Education indicate that this year represents the peak of enrollment in high schools and it may therefore be expected that within a few years the engineering school enrollment will begin to drop.

Addressing his attention particularly to proposals that two to four years of liberal arts college be required for admittance to a technical school, Hunter said that as a means of reducing enrollment, this would function simply on the basis of the student's bank account. In any case, he is of the opinion that technical education is in many ways of more cultural value than academic education. Studies made by the Society for the Promotion of Engineering Education, he pointed out, indicate that a graduate of a technical school has ten or twenty times the chance of graduates of any other type of school of obtaining an executive position in industry.

State Senator T. C. Desmond outlined the provisions of the state housing bills which have just passed the legislature under his sponsorship, and N. Max Dunning, assistant chief of the Procurement Division of the Treasury, emphasized the need for cooperation of engineers and architects in pushing research on engineering materials.

The value of including an engineer's appraisal of physical assets in the financial statements of corporations was stressed by President Alfred E. Roche.

New president of the society is F. H. Zurmuhlen. A. K. Johnson became first vice president and Hubert E. Snyder, second vice president. P. M. Corry and Ernest F. Fox retain their positions as treasurer and financial secretary, respectively, and retiring president Roche becomes trustee.

WASHINGTON HIGHLIGHTS

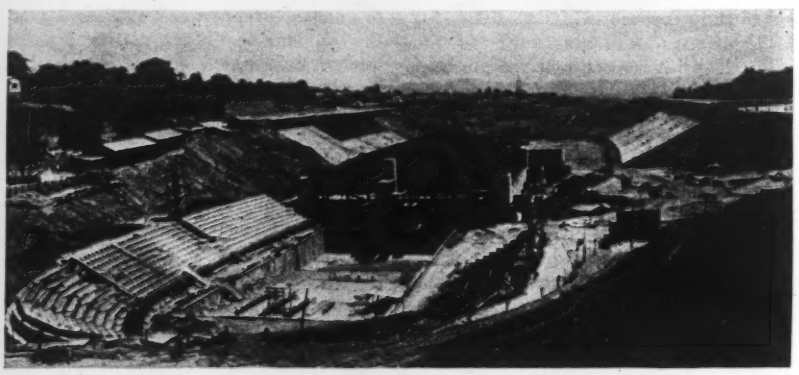
Special reports by Paul Wooton

BETTER PLANNING of Reclamation work is made possible by the new Interior department appropriation act which, in addition to authorizing immediate use of funds, also provides $5,000,000 that may be used to supplement relief funds when more material or machinery is required than WPA rules allow.

That provision will be particularly helpful in the water developments recommended by the Northern Great Plains Committee. The Farm Security Administration will cooperate in selecting projects. The Bureau of Reclamation will act as the construction agency on these projects which then will be turned over to the Farm Security Administration. This avoids the difficulties of a resettlement contract.

CONTRACTS are being awarded by the Bureau of Reclamation for transmission line materials to be used between Parker Dam and Phoenix. While power will not be developed at Parker for two years, the line is to be used to carry power from Boulder Dam to the Salt River valley where a water shortage has developed. Additional power is needed for pumping purposes. Plans call for the operation of the new line before the end of September.

FEDERAL cooperation with the government of Panama in the construction of a 70-mile highway from the Canal Zone to an Army bombing range and landing field at Rio Hato is provided for in a bill which has passed the Senate.



BRAZIL BUILDS BIG STADIUM

WHEN COMPLETED this stadium which is now under construction at Sao Paulo, Brazil, will probably be the largest in the Americas. Its seating capacity of about 130,000 will exceed the 125,000 capacity of the Municipal Stadium at Chicago and the Sesquicentennial Stadium at Philadelphia.

LABOR NOTES

LETTING of contracts for construction of about five miles of pavement on U.S. Highway 12 was postponed last week by the Michigan state highway department when the Michigan truck drivers' union, an A.F.L. affiliate, protested the classification of operators of 1½-ton trucks as common labor.

A TWO-YEAR agreement between the laborers union and the Peoria, Ill., Building Exchange provides for a minimum wage of 87.5 cents an hour (a five-cent increase), a 40-hour week, and double time for overtime or holiday work.

AT DAVENPORT, Ia., the Ready-Mix Concrete Co. has signed a union contract at a scale providing that mixer-truck drivers receive 68 cents an hour, thus opening the way to the use of ready-mix concrete on unionized construction jobs.

CONTRACTS AND CAPITAL

ENGINEERING construction awards for the short week due to the Memorial Day holiday total $39,887,000, a decrease of 12 per cent from the volume for the corresponding week last year.

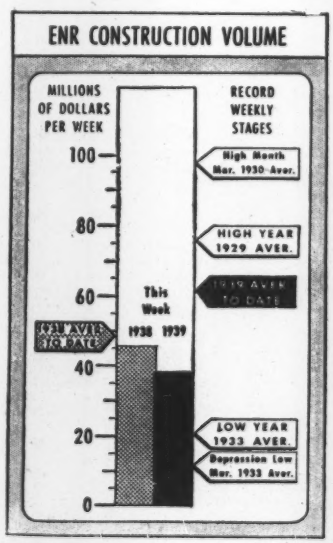
The week's total brings construction awards for 1939 to date to $1,334,716,000, an increase of 24 per cent over the $1,077,115,000 for the 22-week period last year.

Public construction for the week is 3 per cent higher than a year ago, but private awards are 60 per cent lower than in the short week last year.

In the classified construction groups, waterworks, bridges, and earthwork and drainage top their respective volumes for the 1938 week, and bridges and earthwork and drainage are above last week.

New capital for construction purposes for the week, $36,573,000, is 68 per cent below the $114,240,000 reported for the week last year. The current week's total is made up of $27,514,000 in USHA loans for low-rent slum-clearance projects in 19 cities, $8,980,000 in state and municipal bonds, $63,000 in corporate security issues, and $16,000 in RFC loans for public improvements.

New construction financing for 22 weeks of 1939 totals $871,127,000, a 28 per cent gain over the $679,126,000 for the corresponding period last year.



CONTRACTS

(Thousands of dollars)

	Week Ending June 2 1938	May 25 1939	June 1 1939
Federal	$2,034	$5,556	$4,334
State & Municipal	32,679	44,147	31,287
Total public	$34,713	$49,703	$35,621
Total private	10,537	21,619	4,266
TOTALS	$45,250	$71,322	$39,887
Cumulative 1939 (22 weeks)			$1,334,716
Cumulative 1938 (22 weeks)			$1,077,115

Note: Minimum size projects included are: Waterworks and waterways projects, $15,000; other public works, $25,000; industrial buildings, $40,000; other buildings, $150,000.

NEW PRODUCTIVE CAPITAL

	Cumulative 1938 22 Wk.	1939 22 Wk.
NON-FEDERAL	$592,594	$559,700
Corporate securities	175,474	118,125
State & Mun. bonds	297,921	287,298
R.E.A. loans	250	37,801
R.F.C. loans	63,420	250
P.W.A. allotments	2,036	.....
U.S.H.A. loans	53,493	116,226
FEDERAL	$86,532	$311,427
TOTAL CAPITAL	$679,126	$871,127

FHA MORTGAGES

	Week Ending May 28 1938	May 20 1939	May 27 1939
Selected for appraisal	$24,054	$25,814	$24,283*
Cumulative 1939 (21 weeks)			$489,161*
Cumulative 1938 (22 weeks)			$360,056

*Subject to revision.

ENR INDEX NUMBERS

Index Base		1913	1926
Construction Cost	May	234.69	112.82
Building Cost	May	196.60	106.28
Volume	Apr.	221	97

OBITUARY

JOHN BROGAN, an early midwestern contractor, died May 19, in Green Bay, Wis., at the age of 74. His firm, John Brogan & Co. and later John Brogan & Sons Co., held many early railroad contracts and built many street, highway, sewer, and water works projects in Wisconsin, Illinois and Iowa.

WILLIAM C. STEVENS, 55, vice president in charge of engineering since 1930 of Cutler-Hammer, Inc., of Milwaukee, died May 15. Stevens had been connected with Cutler-Hammer ever since his graduation from Cornell University in 1906.

• • •

Army Approves Plan For Niagara Bridge

The U. S. War Department has given its approval to plans submitted by the Niagara Falls Bridge Commission for a bridge across the Niagara River connecting Niagara Falls, N. Y., with Niagara Falls, Ont. The proposed bridge would replace the Falls View Bridge which was carried out by ice early last year.

Meanwhile, however, a technical difficulty has arisen in connection with the financing of the bridge. The bridge commission contracted privately to sell the revenue bonds to a financing house, but the state and federal governments have insisted on competitive bidding for the bonds.

• • •

Railroad Aid Passes Senate

(*Continued from p. 1*)

companies" as well as "all contract carriers by water, by air, or by motor vehicles. The commission is given the same powers of rate regulation and regulation of conditions of service over all these means of transport that it now has over railroads.

Exceptions to the jurisdiction of the commission are made in the case of certain types of motor vehicle service, and also in the case of transportation by interstate contract carriers by water, of property which "by reason of the inherent nature of the commodities transported, their requirements of special equipment, or their shipments in bulk, are not actually and substantially competitive with transportation by interstate commerce carriers." Also specifically attempted in the act is transportation of water or natural or artificial gas by pipe lines.

CONSTRUCTION REPORTS

Compiled by BUSINESS NEWS DEPARTMENT
Engineering News-Record, 330 W. 42nd St., New York
ELSIE EAVES, MANAGER
(Daily service also available—Write for details)

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterworks, $15,000; other public works, $25,000; industrial buildings, $40,000; other buildings, $150,000.

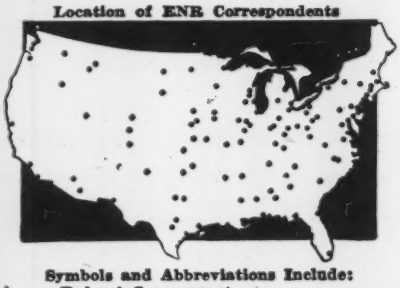
Classes of Construction
(Named in order of Listing)

Water Supply	Unclassified
Sewers, Waste Disposal	Materials, Equipment
Bridges, Grade Cross'gs	Public Buildings
Streets & Roads	Commercial Buildings
Earthwork, Waterways	Industrial Buildings

Stages Reported

PROPOSED: (except Streets & Roads);
BIDS ASKED (new announcements only. For full calendar, see also preceding issues of ENR);
LOW BIDDERS ($500,000 projects and over);
CONTRACTS AWARDED

Location of ENR Correspondents



Symbols and Abbreviations Include:

† Federal Government
★ Project of $500,000 or over
ENR Engineering News-Record
CD McGraw-Hill Construction Daily

WATER SUPPLY

PROPOSED WORK

N. J., Jersey City—City, City Hall, watermains, 16 and Marceles Sts. $15,560. T. E. Lynch, 1 Newark Ave., Jersey City. WPA and Owners, engr.

Tex., Premont—WW sys., distr. lines, retaining reservoir, pumping unit. $52,000. $20,000 RFC loan and $32,000 WPA allot.

†**Wash., Marysville**—Dpt. Interior, Bureau Indian Affairs, wood stave pipe, concrete diversion dam and fence on Tulalip Indian Reservation, near here. $33,306. WPA asked to allot $20,571 for labor.

Wis., Seymour—Water softening and iron removal plant. A. E. McMahon Engr. Co., Menasha, engr.

Ont., Port Credit—Toronto Twp., water services, Centre Rd. N. $31,000. Gore & Storrie, 36 Toronto St., Toronto, engrs.

Ont., St. Catherines—L. S. Bessey, clk. Grantham Twp., WW exten. $25,000. **Maturity summer.**

Que., Sherbrooke—W. H. Veilleux, engr., City Hall, water-main exten. 530,000.

BIDS ASKED

Bids Asked June 5

Pa., Pittsburgh—F. M. Roessing, dir. P. Wks., imprv. 33 St. branch basin. $70,000. J. J. Croak, city engr.

Bids Asked June 9

†**Tenn., Covington**—Treas. Dpt. at office Sup. Archt., Wash., D. C., new water piping heating boiler, etc., at post office.

Bids Asked about June 10

O., Toledo—Filtered water reservoir, Greeley & Hansen, 6 N. Michigan Ave., Chicago, Ill., engrs.

Bids Asked June 15

Mass., Boston—Metropolitan Dist. Water Supply Comn., 20 Somerset St., furnishing, del. air valves, needle valve and pivot valve, piezometer rings and meter tubes with register indicator records, tunnel unwatering pump, sump pump and air blowers for pressure aqueduct in towns of Southborough, Framingham and Weston, Contr. 87. PWA. R. N. Molt, secy.

Bids Asked about June 17

O., Toledo—Crosstown main, Greeley & Hansen, 6 N. Michigan Ave., Chicago, Ill., engrs.

Bids Asked June 20

O., Toledo—New intake crib and connecting conduit, consisting 15,800 ft. 100 in. steel or concrete pipe, Lake Water Sys., Dir. F. $1,750,000. Greeley & Hansen, 6 N. Michigan Ave., Chicago, Ill., engrs.

Bids Asked June 27

★**O., Toledo**—Elevated tank and 11,200 ft. 78 in. main, Lake Water Sys., Div. H & I. $1,500,000. Greeley & Hansen, 6 N. Michigan Ave., Chicago, Ill., engrs.

Bids Asked about Aug. 5

O., Toledo—Filter plant structures, piping and equip., electrical work, chemical handling, pumps and motors. Greeley & Hansen, 6 N. Michigan Ave., Chicago, Ill., engrs.

Bids Asked about Sept. 2

O., Toledo—Lake Erie Pump Station structure, pump, engine, piping, valves, sluice gates and equip., electrical work, High Service Pump Station structures, pump, motors, piping and equip., electrical work; drainage roads and walks, Lake Erie Pump Station; drainage, roads and walks, filter plant; outside lighting; attendants house; landscaping and planting. Greeley & Hansen, 6 N. Michigan Ave., Chicago, Ill., engrs.

LOW BIDDERS

★**Ill., Chicago** — O. E. Hewitt, comr. P. Wks., May 22, water filtration plant tunnels, vicinity 77 St. and Lake Michigan, from Wenzel Henoch Co., 3704 S. Clement St., Milwaukee, Wis., $1,589,200. CD 5/9—ENR 5/11.

CONTRACTS AWARDED

Calif., Inglewood—Furnishing, laying steel pipe line in Victoria Ave., to Southern Pipe & Casing Co., Azusa, **$1.24** (excluding sales tax). Bids 5/16. CD 5/12.

Idaho, Bellevue—Reconstructing water sys., **WPA. $18,000.** W. H. Merritt, Twin Falls, engr. CD 3/22—ENR 3/30.

Ia., Dubuque—Pump line for WW, to T. Flynn Coal Co., 3 St. Ext., **$4,917.** Bids 5/22. Rejected bids 5/22 for deep well pump and erection pumphouse. CD 5/10.

Ia., Menlo—J. H. Wilson, city clk., WW imprvs., pumphouse., to C. Jones, Menlo, **$528;** and to Layne Western Constr. Co., 53 W. Jackson St., Chicago, Ill., **$704.** Bids 5/17. CD 5/9—ENR 5/11.

Mass., Lunenburg—Steel standpipe for WW sys., to Pittsburgh-Des Moines Steel Co., Neville Island, Pittsburgh, Pa., **$7,450;** equip., to Fairbanks Morse & Co., Inc., 178 Atlantic Ave., Boston, Mass. Total est. $15,900. Bids 5/22. CD 5/15—ENR 5/18.

Mass., Provincetown—Water Dpt., Marion Perry, chn. Bd. Water Comrs., Town Hall, filtration plant, iron removal, etc., to Frank A. Days & Sons, 24 Pearl St. Est. **$27,000.** Bids 5/2, awarded 5/22. CD 5/18—ENR 5/18.

Mo., Macon—L. T. Dameron, Jr., city clk., water treating and storage reservoir, equip., fdns., for water and power plant, etc., to Ebbe Constr. Co., 312 McPherson Ave., Trenton, **$61,924.** Bids 5/11. CD 1/4—ENR 1/12.

N. J., Newark—40 in. aqueduct in 9 St., **WPA. $299,010.** J. Costello, City Hall, city and WPA engr.

N. Y., Schenectady—C.I. watermains in Kingston Ave. and Seneca St., own forces. Over **$15,000.** L. C. Purdy, city engr.

N. C., Asheboro—General contract WW imprvs., treatment plant, to A. H. Guion Co., Kinney Bldg., Charlotte, **$106,900. PWA.** Bids 5/16. CD 5/2—ENR 5/4.

N. C., Durham—Contr. 10, altitude valves, to Chapman Valve Mfg. Co., Indiana Orchard, Mass., **$850. PWA.** Bids 3/15, awarded 4/20.

O., Covington—New WW., to E. A. Mariani Co., Richmond, Ind.***pumps and controls, to A. D. Cook Co., Lawrenceburg, Ind.***elevated tank, to Chicago Bridge & Iron Wks., 37 W. VanBuren St., Chicago, Ill. Total est. **$45,000.** Bids 5/12, awarded 5/17. CD 5/1—ENR 5/4.

Okla., Grandfield—Lowering water mains, **WPA. $23,333.** R. Lindsay, Old Court House, Oklahoma City, engr.

Okla., Spiro—Rebuilding filter plant, **WPA. $19,000.** R. Lindsay, Old Court House, Oklahoma City, engr.

Tex., Schulenburg—C. B. Nordhausen, mayor, WW imprvs., 60,000 gal. steel reservoir, 4 in. distributing pipe, day labor and "Purchase and Hire" plan. **$25,000.**

Wash., Port Townsend—Exten. water supply sys., untreated wood stave pipe, to Hadlock-Irondale Dist., **WPA. $21,169.** CD 4/26—ENR 5/4.

Wis., Milwaukee—City, laying watermains N. Broadway, to Wisconsin Sewer & Constr. Co., 2246 S. 35th St. **$3,305,** W. Walnut St., to Tomaro Contractors, Inc., 3404 Armour Ave., Cudahy, Wis. **$14,415.** Bids May 16. CD 5/12.

Wyo., Lovell—Exten., replacing watermains, **WPA. $21,905.**

SEWERS, WASTE DISPOSAL

PROPOSED WORK

Calif., San Bernardino—Big Bear Sanitation Dist., c/o County Clerk, sewerage imprvs. Over $25,000.

Calif., Stege—Stege Sanitary Dist., exten. sewers into new residential section. $26,000 or more.

Ill., Signal Hill (East St. Louis, P. O.)—Sanitary sewer sys., varying sizes.

La., Baton Rouge — East Baton Rouge Police Jury, postponed bids May 16. Two incinerators, N. W. Overstreets & Town, Baton Rouge, engrs. CD 4/28—ENR 5/4.

Mich., Albion — Sewage treatment plant, $250,000. W. Clark Dean, member of com. Engineer not appointed.

N. J., Kearny—Storm sewer to relieve flood conditions in various streets. $42,426. WPA. T. E. Lynch, 1 Newark Ave., Jersey City, WPA and owner's engr.

N. Y., Binghamton — Sanitary sewers in Highland and Jerome Aves., Jerome Court, English and Merritt Sts. Over $25,000. J. A. Giles, City Hall, engr.

★**O., Sandusky**—City wide new trunk sewerage sys., $730,000. E. E. Martung, Sandusky, engr.

Tex., Premont—Sanitary sewer collecting lines, small disposal plant, $68,000. $18,000 RFC loan and $50,000 WPA allot.

Alta., Innisfail — Sewerage sys. $25,000. Haddin & Myles, Calgary, engrs.

Ont., Hespeler—Sewage sys. $103,000. James, Proctor & Redfern, 36 Toronto St., Toronto, engrs. CD 1/11—ENR 1/19.

Ont., Sudbury—W. B. MacMullen, engr., City Hall, bids this month incinerator equip. $20,000. CD 5/5—ENR 5/11.

★**Que., Montreal** — Executive Comn., City Hall, elevated pumps and station for Little St. Pierre River sewage sys. $500,000 voted. J. A. Blanchard, City Hall, dir. P. Wks.

Que., Sherbrooke—Additional sewer main exten. $30,000. W. H. Veilleux, City Hall, engr.

Sask., Regina—Incinerator. Over $25,000. Refuse Converter, Ltd., 5 Credit Foncier Bldg., engrs.

BIDS ASKED

Bids Asked June 5 or 6

Minn., Winsted—F. Roufs, village recdr., sewer lines, being Part 2 of PWA sewer and treatment plant project. Total est. $84,000. Tentative date. Druar & Milinowski, 830 Globe Bldg., St. Paul, engrs. CD 12/28—ENR 1/5.

Bids Asked June 6

Mo., Springfield—Trickling filter sys. in connection with sewage disposal plant addn. Total est. $400,000. Black & Veatch, 4706 Bway., Kansas City, Mo., engrs. CD 3/13—ENR 3/16, under "CA".

Bids Asked June 9

Ind., Versailles—E. H. Bailey, pres. Town Bd., American Legion Hall, Div. 2, outfall sewer, treatment plant; Div. C, water pumping station, purification works. Bids Apr. 28 rejected. PWA. Total est. $130,000. L. S. Finch, 272 Century Bldg., Indianapolis, consult. engr. CD 4/19.

Bids Asked June 15

★**Ind., Hammond**—Sanitary Dist., J. E. Haney, pres., City Hall, Div. 4, Kennedy Ave. interceptor, 5,000 ft. 24 in. pressure main and 5,000 ft. 30 in. rein.-con. gravity sewer, manholes, etc. Part of $3,000,000 PWA project. C. Hurd, 1039 Architect & Builders Bldg., Indianapolis, consult. engr.